
Elanco
Pig Zero
Singling him out is never this easy.
Denagard®
tiamulin hydrogen fumarate
Whole-herd health

Study: Effects of Different Antibiotic Feeding Programs[1]

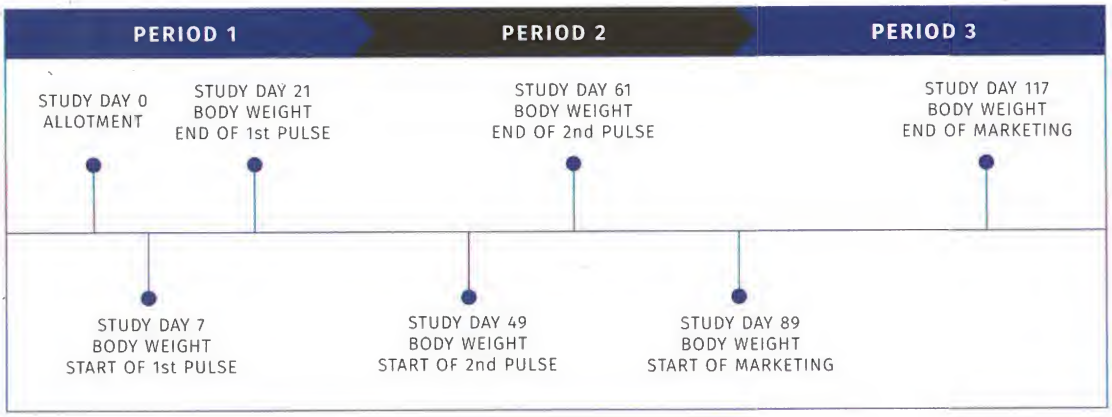
A commercial population of approximately 1,150 growing pigs averaging approximately 75 lb with a known history of swine pneumonia and bacterial enteritis was studied to understand the effects of different antibiotic programs. Confirmation of the disease-causing bacterial agents (*Pasteurella multocida, Escherichia coli* and *Salmonella* Choleraesuis) was determined using laboratory diagnostics.

STUDY DESIGN:

- 9-week-old pigs averaging approximately 75 lb were placed and acclimated in the barn for 7 days
- Total pigs: approximately 1,150 pigs (approx. 25 per pen)
- Total pens: 46 single-gender pens of growing pigs were utilized in a randomized complete block design
- Total replicates: 23 per treatment
- Weights were recorded on days 0, 7, 21, 49, 61, 89, and at the time of marketing
- Live weight, average daily gain (ADG), average daily feed intake (ADFI), feed to gain (F:G, calculated), and gain to feed (G:F, calculated) were collected and reported by pen
- Live weight, hot carcass weight (HCW), and carcass yield were collected and reported by pen

TREATMENT GROUPS:

Treatment 1 = Negative control (no medication)
Treatment 2 = Denagard 35 grams/ton + 400 grams/ton CTC from day 7 to 20 and day 49 to 62



Disease scores (coughing, diarrhea, lameness, antibiotic treatments) collected daily.

MARKETING STRATEGY:

Each pen was marketed using the same schedule:

- Group 1 (Day 90): Heaviest 12% of pen (i.e., 3 pigs)
- Group 2 (Day 104): Next heaviest 24% or 28% of pen (i.e., 6 or 7 pigs)
- Group 3 (Day 110 or 111): Next heaviest 48% or 52% of pen (i.e., 12 or 13 pigs)
- Group 4 (Day 118): Final 12% of pen (i.e., 3 pigs)

The pigs were weighed the day before shipment for slaughter and transported to a commercial slaughter facility where hot carcass weight (HCW) was recorded.

Study Results

TABLE 1. DISEASE INCIDENCE FROM DAY 0 TO STUDY END

	DIETARY TREATMENT			
	CONTROL	DENAGARD + CTC	S.E.M.	*P*-VALUE
NO. OF PENS	23	23	—	—
DRY COUGH, NO. OBS*/PEN	32.09	29.26	1.753	0.10
DIARRHEA, NO. OBS/PEN	0.83	0.39	0.172	0.08
LAMENESS, NO. OBS/PEN	74.43[x]	63.04[y]	5.378	<0.001
ANTIBIOTIC TREATMENTS, NO./PEN	—	—	—	—
RESPIRATORY	0.83	0.65	0.179	0.50
DIARRHEA	0.13[x]	0.00[y]	0.003	<0.001
LAMENESS	23.35[x]	10.35[y]	2.244	<0.001

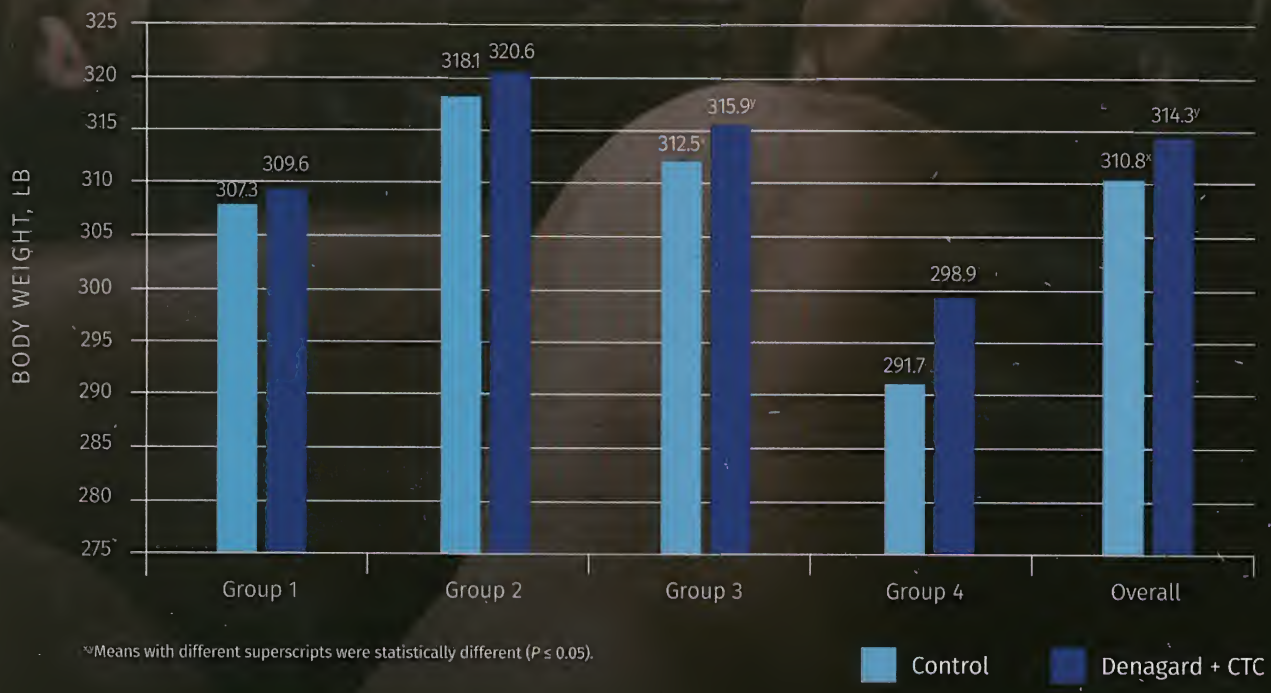
[x,y]Means with different superscripts were statistically different ($P \leq 0.05$).
*OBS = observed.

TABLE 2. OVERALL RESULTS SUMMARY — FROM DAY 0 TO STUDY END

	DIETARY TREATMENT			
	CONTROL	DENAGARD + CTC	S.E.M.	*P*-VALUE
NO. OF PENS	23	23	—	—
START WEIGHT, LBS	75.1	75.0	0.90	0.30
FINAL WEIGHT, LBS	310.8[x]	314.3[y]	2.60	0.02
ADG, LBS	2.21[x]	2.24[y]	0.021	0.01
ADFI, LBS	6.18[x]	6.30[y]	0.093	0.005
F:G	2.80	2.81	0.021	0.51
G:F	0.358	0.357	0.0027	0.49
MORTALITY[1], % OF PIGS	2.09	1.56	—	0.51
HCW, LBS	236.7[x]	239.0[y]	1.96	0.05
CARCASS YIELD, %	76.16	76.04	0.179	0.55

[x,y]Means with different superscripts were statistically different ($P \leq 0.05$).
[1]Includes morbidity and mortality.

CHART 1. BODY WEIGHT — ALL MARKETING GROUPS



[x,y]Means with different superscripts were statistically different ($P \leq 0.05$).

Key Findings

Incidence of disease for pens treated with Denagard + CTC was lower than in the control group. Additionally, there was a reduced need to treat respiratory disease, diarrhea and lameness with antibiotics for those in the Denagard + CTC group.

Pens treated with Denagard + CTC performed better than the control group.

By controlling on-label pathogens, this study resulted in:

- 3.5 lb heavier final weight
- 1.4% better ADG
- 1.9% improved ADFI
- 2.3 lb heavier HCW

Don't wait for

Pig Zero

Whole-herd health

When it comes to treating disease on your operation, isolating the source can be difficult. So, protect the population with the proactive choice that's right for your herd and best for your business.

Denagard and chlortetracycline (CTC) control swine dysentery associated with *Brachyspira hyodysenteriae* susceptible to tiamulin, and treats swine bacterial enteritis caused by *Escherichia coli* and *Salmonella* Choleraesuis sensitive to CTC, and bacterial pneumonia caused by *Pasteurella multocida* sensitive to CTC.

Denagard and CTC both act at the ribosomal level, inhibiting protein synthesis, but their binding sites are different. Together, the two antibiotics increase the activity against labeled pathogens and enlarge the spectrum of control to certain gram-negative bacteria. While using Denagard alone does not require a Veterinary Feed Directive (VFD), using Denagard + CTC does.

Are you doing what's right for your herd and best for your business?

Talk to your local Elanco sales representative or technical consultant to learn more about protecting whole-herd health with Denagard.

The label contains complete use information, including cautions and warnings. Always read, understand and follow the label and use directions.

Denagard 10 Premix

Indications:

For control of swine dysentery associated with *Brachyspira hyodysenteriae* susceptible to tiamulin:

- Feed 35 g/ton
- Feed continuously as sole ration
- 2-day withdrawal

For treatment of swine dysentery associated with *Brachyspira hyodysenteriae* susceptible to tiamulin:

- Feed 200 g/ton
- Feed for 14 days for treatment
- 7-day withdrawal

For control of ileitis associated with *Lawsonia intracellularis* susceptible to tiamulin:

- Feed 35 g/ton
- Feed for not less than 10 days
- 2-day withdrawal

Denagard + CTC

Indications:

For the control of swine dysentery associated with *Brachyspira hyodysenteriae* susceptible to tiamulin and for treatment of swine bacterial enteritis caused by *Escherichia coli* and *Salmonella* Choleraesuis sensitive to chlortetracycline and treatment of bacterial pneumonia caused by *Pasteurella multocida* sensitive to chlortetracycline:

- 35 g/ton of Denagard + 400 g/ton (10 mg/lb body weight in daily divided doses) CTC
- Feed for 14 days
- 2-day withdrawal

Using Denagard alone does not require a Veterinary Feed Directive (VFD). Using Denagard + CTC does require a VFD.

Caution: Federal law restricts medicated feed containing this veterinary feed directive (VFD) drug to use by or on the order of a licensed veterinarian.

Important Safety Information

- Swine being treated with Denagard (tiamulin) should not have access to feeds containing polyether ionophores (e.g. lasalocid, monensin, narasin, salinomycin and semduramicin) as adverse reactions may occur.
- If signs of toxicity occur, discontinue use.
- Withdraw 7 days before slaughter at 200 g/ton and 2 days before slaughter at 35 g/ton.
- Keep out of reach of children. Avoid contact with skin.
- For use in swine only.
- The effects of tiamulin on swine reproductive performance, pregnancy and lactation have not been determined.

Denagard LC

Indications:

For treatment of swine dysentery associated with *Brachyspira hyodysenteriae* susceptible to tiamulin:

- Utilize Denagard LC in drinking water at 3.5 mg/lb (60 ppm) for five days

For treatment of swine pneumonia associated with *Actinobacillus pleuropneumoniae* susceptible to tiamulin:

- Utilize Denagard LC in drinking water at 10.5 mg/lb (180 ppm) for five consecutive days

Important Safety Information

- Swine being treated with Denagard (tiamulin) should not have access to feeds containing polyether ionophores (e.g. lasalocid, monensin, narasin, salinomycin and semduramicin) as adverse reactions may occur.
- If signs of toxicity occur, discontinue use of medicated water and replace with clean, fresh water.
- Withdraw medicated water 3 days before slaughter after treatment at 3.5 mg/lb and 7 days before slaughter following treatment at 10.5 mg/lb.
- Keep out of reach of children. Avoid contact with skin.
- For use in drinking water of swine only. Prepare fresh medicated water daily. The effects of tiamulin on swine reproductive performance, pregnancy and lactation have not been determined.
- If no response to treatment is obtained within 5 days re-establish the diagnosis.

[1]Elanco Animal Health. Data on file.

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Elanco supports the use of shared class antibiotics for therapeutic uses while under the oversight of a veterinarian. More details on Elanco's Antibiotic, Welfare and Sustainability Policies can be found on www.elanco.com/antimicrobialpolicy.

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